**Trigonometric Identities**

**\*\*Be sure to state any restrictions on the variable\*\***

1. **Verify each identity.**
2. cos*x* csc*x* = cot*x*
3. sin*x* cos*x* cot*x* = cos2*x*
4. tan2*x* cos2*x* = sin2*x*
5. csc*x* tan*x* cos*x* = 1
6. 4cot2*x* sin*x* tan*x* = 4cos*x*
7. 3sin*x* sec*x* tan*x* = 3tan2*x*
8. **Show that each equation is an identity.**
9. csc*x* (sin*x* + cos*x*) = 1 + cot*x*
10. (1 +cos*x*)(1 – cos*x*) = sin2*x*
11. sin*x* (sin*x* + csc*x*cos2 *x*) = 1
12. tan*x* (sin*x* + cot*x* cos*x*) = sec*x*
13. (sin*x* – cos*x*)2 + (sin*x* + cos*x*)2 = 2
14. **Prove.**
15. sin*x* – cos2*x* sin*x* = sin3*x*
16. tan*x* sin2*x* + tan*x* cos2*x* = tan*x*
17. sec*x* csc2*x* – sec*x* = sec*x* cot2*x*
18. tan3*x* sec2*x* – tan3*x* = tan5*x*
19. **Verify the following statements.**
20. 2cos*x* + 2tan2*x* cos*x* = 2sec*x*
21. tan2*x* – sin2*x* tan2*x* = sin2*x*
22. tan*x* csc*x*2 – tan*x* = cos*x* csc*x*
23. **Prove.**
24. + sinx = cscx
25. **Transform one side of the equation to be sure it is equivalent to the other side of the equation.**
26. sin2βsecβcscβ = tanβ
27. sinx(cscx – sinx) = cos2x
28. tanx + tan3x = tanxsec2x
29. cscxcotxcosx = cot2x
30. (1 + cotx)(1 + cotx) = csc2x + 2cotx
31. sin3x + sinxcos2x = sinx
32. sinxcscx – tan2xcos2x = cos2x
33. cotx(tanx + cotx) = csc2x
34. **Prove that each equation is an identity.**
35. cotx – sin2xcotx = cos3xcscx
37. tanϕ + cotϕ = secϕcscϕ
38. **Prove that each equation is an identity.**
39. –
40. ***Solve* for all possible values of x.**
41. sinx =-
42. cotxsinx =
43. secx = 2
44. cscx + 1 = 0
45. cosx = 0.42
46. tanxcosx = 0.7
47. 3secx – 4 = 0
48. sinxcscx + cosx = 0
49. 2sinx – cosxsecx = 0
50. 4secx + 5 = 0